

# ANNUNZIATA PIRRO

OGS - Istituto Nazionale di Oceanografia e di Geofisica Sperimentale  
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## EDUCATION

### UNIVERSITY OF NOTRE DAME

Notre Dame, IN, USA

**Ph.D. in Civil and Environmental  
Engineering and Earth Sciences**

May 2019

GPA:3.7/4

Thesis title: Dynamics of Waves and Currents in the Bay of Bengal During Monsoons

Advisor: Prof. Harindra Joseph Fernando

### UNIVERSITY OF SALERNO

Salerno, Italy

Master Science in Civil Engineering

November 2013

Dissertation: “Freeze-thaw degradation of concrete: experimental tests  
and empirical analysis”

### UNIVERSITY OF SALERNO

Salerno, Italy

Bachelor Science in Civil Engineering

June 2008

Dissertation: “Cost effective optimization of building energy  
consumption through the use of renewable energy”

## RESEARCH EXPERIENCE

European Space Agency (ESA), ESRIN

Frascati, Italy

Researcher Scientist

**Earth Observation Summer School**

August 2018

- Learned how to assimilate the Earth Observation satellite data into Earth System models to increase model’s prediction skills
- Trained on different techniques that integrate the use of ocean satellite observations with in-situ data to improve the knowledge of the meso and sub-mesoscale dynamics

SRI LANKA, SOUTH BAY OF BENGAL

Sri Lanka

Scientist

**Cruise on Tommy Thompson, Oceanographic Research Vessel**

June 2018 – July 2018

Examination of Monsoon intraseasonal oscillations using oceanic and atmospheric instrumentations. Deployment of long term moorings along the meridional transect 8-14°N, 85°E. Investigation of surface and deep currents using in-situ measurements (ADCP, VMP, SCANFISH and CTD). SeaGliders and Drifters remote sensors were used to measure temperature, salinity and velocity up to 500 m of depth.

CALIFORNIA, SAN DIEGO

California

Scientist

**Cruise on Sally Ride, Oceanographic Research Vessel** September 2017 – October 2017

Investigation of Air Sea coupled processes in the coastal region to fully characterize the Marine Atmospheric Boundary Layers as an electromagnetic propagation environment. Investigation of surface and deep currents using in-situ measurements (ADCP, VMP, and CTD). SeaGliders were used to measure temperature, salinity and velocity up to 1 Km depth. Atmospheric measurements are also carried out using lidars and balloons for the Air Sea Interaction study.

NASA Jet Propulsion Laboratory (JPL) and  
Keck Institute for Space Studies

Pasadena, California

Researcher Scientist

**Summer School**

August 2017

- Trained on how to use satellite observations to advance Global Climate Models with a staff of 24
- Learned how to use Climate Model Diagnostic Analyzer software developed by NASA
- Strengthened Satellite knowledge

U.S. NAVAL RESEARCH LABORATORY

Stennis Space Center, Mississippi

Researcher

**Summer internship**

June 2016

- Collaborated with research vessel colleagues to interpret the in-situ data collected onboard of scientific research cruises.
- Trained extensively on COAMPS and HYCOM model analysis techniques enabling in-situ model data comparison to better support data analysis
- Drafted initial manuscript for future publications

SRI LANKA, SOUTH BAY OF BENGAL

Sri Lanka

Scientist

**Cruise on Roger Revelle, Oceanographic Research Vessel** July 2015 – August 2015

Recovering of moorings instrumentation after 1 year and a half of operation. Investigation of surface and deep currents using *in-situ* measurements (CTD, ADCP). Deployment of two SeaGliders remote sensors. Capturing seasonal variability with long-term collection of data.

SRI LANKA, SOUTH BAY OF BENGAL

Sri Lanka

Scientist

**Cruise on Roger Revelle, Oceanographic Research Vessel**

June 2014 – July 2014

Examination of wind driven, seasonally occurring mesoscale cyclonic features  
Investigation of surface and deep currents using *in-situ* measurements (ADCP, VMP, SCANFISH and CTD). SeaGliders and Drifters remote sensors were used to measure temperature, salinity and velocity up to 1 Km of depth.

UNIVERSITY OF BELFAST

Belfast, UK

**Civil Engineering Internship**

January 2012 – August 2012

Investigation of concrete damage due to Freeze and Thaw cycles. Formulation of a new mix design to improve concrete durability from salt corrosion.

## **PROFESSIONAL EXPERIENCE**

FARRANS CONSTRUCTION

United Kingdom, UK

Engineer

May 2012 – August 2012

Construction of a 500 m new quay wall structure at Belfast Harbour port for support of offshore wind turbine logistics facility. I oversaw the work of junior staff and mentored civil engineers throughout the chartership process.

SIPE, Engineering Company

Salerno, IT

Engineer

April 2008 – June 2008

Using of Computer-Aided Design (CAD) software for designing projects and undertaking complex and repetitive calculation for the design of a school in Naples.

## **AWARDS**

2019 Professional Development Grant

University of Notre Dame  
February 2019

2018 Professional Development Grant

University of Notre Dame  
July 2018

2018 Short Term Graduate Research Fellowship

Notre Dame Rome Global Gateway  
July 2018

2017 NASA JPL award

Pasadena, California  
June 2017

IndianaView Scholarship

University of Notre Dame  
March 2017

NASA Travel Grant

University of Notre Dame  
March 2016

Outstanding International Thesis Project

Salerno, Italy  
September 2012

## TECHNICAL SKILLS

Deployment and use of VMP, CTD and SCANFISH instrumentation  
Numerical Analysis: MATLAB, Mathematica, Grapher, Surpher, Python(beginning)  
Software Visualization and Graphics: Adobe Photoshop  
Operating Systems: Apple OS X, Unix/Linux, Windows  
Desktop Editing and Productivity Software: L<sup>A</sup>T<sub>E</sub>X, Microsoft Office, Google Docs

## PUBLICATIONS

**Pirro, A.**, H. J. S. Fernando and H. Wijesekera: Investigation of Anticyclonic eddy formation South East of Sri Lanka During Summer Monsoons using laboratory experiments, ISEH 2018 Conference paper

Lozovatsky, I., H. Wijesekera, E. Jarosz, M. Lilover, **A. Pirro**, Z. Silver, L. Centurioni, H. J. S. Fernando, 2016: A snapshot of internal waves and hydrodynamic instabilities in the southern Bay of Bengal, *J. Geophys. Res. Oceans*, **121**, 5898–5915

Lozovatsky, I., et. al., 2018: Probability Distribution of the Dissipation Rate in Stratified Turbulence: Microstructure Measurements in the South California Bight, *J. Geophys. Res. Oceans*, DOI: 10.1029/2019JC015087

**Pirro, A.**, et al., 2019: Dynamics of Intra-seasonal Oscillations in Bay of Bengal during Summer Monsoons Captured by Mooring Observations, *Deep-Sea Research Part II*, under review

**Pirro, A.**, et al., 2019: Eddies and Currents in the Bay of Bengal during Summer Monsoons, *Deep-Sea Research Part II*, under review

Lozovatsky, I., et. al., 2019 Turbulence at the Periphery of Sri Lanka Dome, *Deep-Sea Research Part II: Topical study in Oceanography*,  
<https://doi.org/10.1016/j.dsr2.2019.07.002>

## **PRESENTATIONS**

Pirro A. “Dynamics of Eddies during Summer Monsoons”, European Geosciences Union (EGU) 2019, Vienna, April 7–12, 2019

Pirro A. “Investigation of Anticyclonic eddy formation South East of Sri Lanka During Summer Monsoons using laboratory experiments”, ISEH 2018, University of Notre Dame, June 4–7, 2018.

Pirro A. “Formation mechanism of Anticyclonic Eddies South East of Sri Lanka during Summer Monsoons”, Ocean Science Meeting, Portland, February 11–16, 2018.

Pirro A. “Interaction between Southwest Monsoon Current and Sri Lanka Dome during 2015 Summer Monsoon”, Oregon State University, May 10–14, 2016.

## **POSTERS PRESENTATION**

Pirro A. “Shipboard current and hydrographic measurements in the Southern Bay of Bengal during 2015 Summer Monsoon”, Ocean Sciences Meeting, February 21–26, 2016.

Pirro A. “The Structure of Southwest Monsoon Current past Southern Sri Lanka”, 48<sup>th</sup> Liege Colloquium on Ocean Dynamics, May 23–27, 2016.

## **INVITED TALK**

University of Rochester  
University of Bologna  
University of Notre Dame

Rochester, NY, December 2018  
Bologna, IT, July 2018  
Notre Dame, IN, May 2018

## **TEACHING EXPERIENCE**

UNIVERSITY OF NOTRE DAME

Laboratory supervisor

Notre Dame, IN

January 2017 – May 2019

Planning, management, and supervision of undergraduate students’ laboratory activities. Performing laboratory experiment using a rotating tank in order to reproduce Rossby waves’s formation in shallow waters. The particle tracking velocimetry technique is used to track the fluid particles in space and time and the velocity field as well.

UNIVERSITY OF NOTRE DAME

Teaching assistant

Notre Dame, IN

August 2014 – May 2019

I taught:

- Hydraulics-CE40450 for undergraduate students
- Geotechnical Engineering-CE30510 for undergraduate students
- Mechanics of Environmental Motions-CE60465 for graduate students
- Computational Methods (CE30125) CE60465 for undergraduate students

My duties included: answering questions in and out of the class; evaluating student performance, holding office hours for individual student consultation about grades and homework, grading exams and supervising students during laboratory experiments.

## **PROFESSIONAL MEETINGS ATTENDED**

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|--|-----------------------|
| “One Planet, One Ocean”, SDGAcademyX                                   | November, 2018        |
| “ASIRI-EBOB”, Oregon State University                                  | May, 10-14, 2016      |
| “ASIRI Meeting”, New Orleans   | February 27, 28, 2016 |
| “ASIRI-OMM-EBOB”, UMass Dartmouth                                      | May 26-28, 2015       |
| “5 <sup>th</sup> Materhorn Meeting”, University of Notre Dame          | October 6-8, 2015     |
| “Responsibilities and Ethics in the Conduct of Research Workshop”      | January 2015          |
| “Photovoltaic System for sustainable buildings”, University of Salerno | July 2008             |
| “Energy efficiency”, University of Salerno                             | July 2008             |

## **LEADERSHIP AND SERVICE**

- Peer-reviewer for the Journal *Scientific Report*
- The Oceanography Society, Student sub-committee Representative
- Society of Woman Engineers, University of Notre Dame, Outreach Chair
- The Oceanography Society, Member
- American Geophysical Union, Member
- Association of Women in Science, University of Notre Dame, Member
- Boys and Girls club, Mentor
- Engineering Students Association, University of Salerno, President
- ALDIUS, Association of Alumni, University of Salerno, committee chair/Member
- A.C.I., Association for Catholic Italians, Italy, President
- Movimentiamoci, Italian Volunteer Association, Vice President

## **REFERENCES**

**Harindra J. Fernando**

Wayne and Diana Murdy Endowed Professor

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